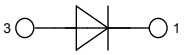
HiPerFRED²

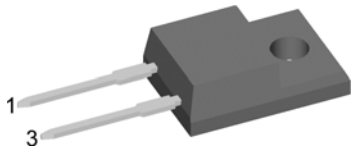
High Performance Fast Recovery Diode
Low Loss and Soft Recovery
Single Diode

V_{RRM} = 400 V
I_{FAV} = 10 A
t_{rr} = 45 ns

Part number

DPG 10 I 400 PM





Backside: isolated

E72873

Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very short recovery time
- Improved thermal behaviour
- Very low Irm-values
- Very soft recovery behaviour
- Avalanche voltage rated for reliable operation
- Soft reverse recovery for low EMI/RFI
- Low Irm reduces:
  - Power dissipation within the diode
  - Turn-on loss in the commutating switch

Applications:

- Antiparallel diode for high frequency switching devices
- Antisaturation diode
- Snubber diode
- Free wheeling diode
- Rectifiers in switch mode power supplies (SMPS)
- Uninterruptible power supplies (UPS)

Package:

- Housing: TO-220FP
- Industry standard outline
- Plastic overmolded tab for electrical isolation
- Isolation Voltage 2500 V
- Epoxy meets UL 94V-0
- RoHS compliant

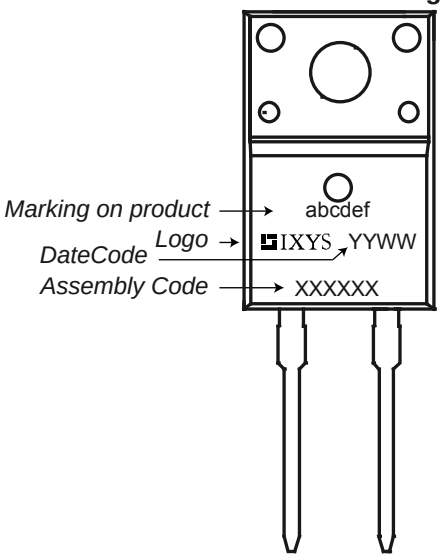
Ratings

Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RRM}	*max. repetitive reverse voltage*		T_{VJ} = 25°C			400	V
I_R	*reverse current*	V_R = 400 V	T_{VJ} = 25°C			1	µA
		V_R = 400 V	T_{VJ} = 150°C			0.15	mA
V_F	*forward voltage*	I_F = 10 A	T_{VJ} = 25°C			1.32	V
		I_F = 20 A				1.51	V
		I_F = 10 A	T_{VJ} = 150°C			1.03	V
		I_F = 20 A				1.24	V
I_{FAV}	*average forward current*	rectangular d = 0.5	T_C = 120°C			10	A
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 175°C			0.77	V
r_F	*slope resistance* }					19.8	mΩ
R_{thJC}	*thermal resistance junction to case*					4.40	K/W
T_{VJ}	*virtual junction temperature*			-55		175	°C
P_{tot}	*total power dissipation*		T_C = 25°C			35	W
I_{FSM}	*max. forward surge current*	t = 10 ms (50 Hz), sine	T_{VJ} = 45°C			150	A
I_{RM}	*max. reverse recovery current*		T_{VJ} = 25°C		4		A
		I_F = 10 A; V_R = 270 V	T_{VJ} = 125°C		6		A
t_{rr}	*reverse recovery time*	$-di_F/dt$ = 200 A/µs	T_{VJ} = 25°C		45		ns
			T_{VJ} = 125°C		65		ns
C_J	*junction capacitance*	V_R = 150 V; f = 1 MHz	T_{VJ} = 25°C		15		pF

Symbol	Definition	Conditions	Ratings min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per pin [1]			35	A
R_{thCH}	*thermal resistance case to heatsink*			0.50		K/W
T_{stg}	*storage temperature*		-55		150	°C
Weight				2		g
M_D	*mounting torque*		0.4		0.6	Nm
F_C	*mounting force with clip*		20		60	N
V_{ISOL}	*isolation voltage*	t = 1 second	2500			V
		t = 1 minute	2000			V
d_S	*creapage distance on surface*		1.07			mm
d_A	*striking distance through air*		1.07			mm

[1] I_{RMS} is typically limited by: 1. pin-to-chip resistance; or by 2. current capability of the chip.
In case of 1, a common cathode/anode configuration and a non-isolated backside, the whole current capability can be used by connecting the backside.

Product Marking



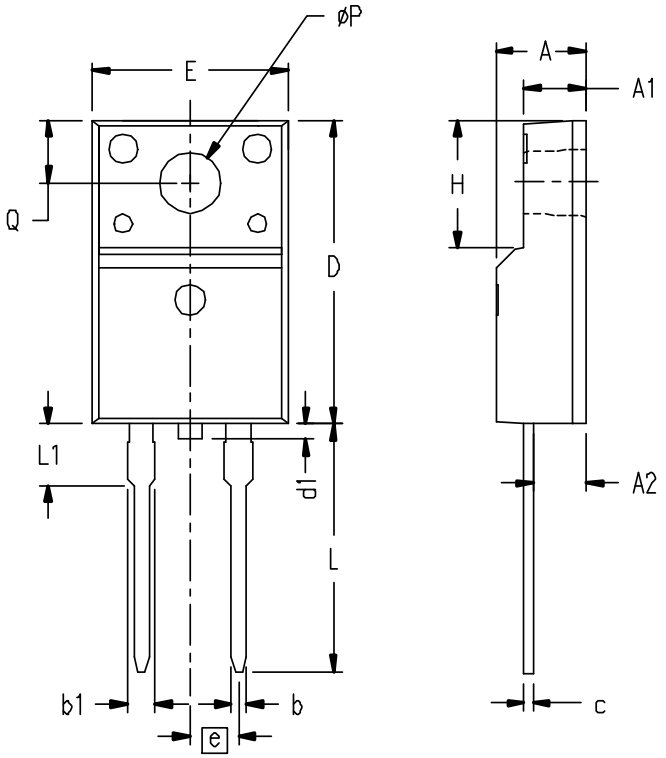
Part number

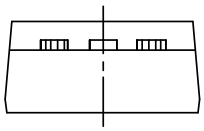
D = Diode
P = HiPerFRED
G = extreme fast
10 = Current Rating [A]
I = Single Diode
400 = Reverse Voltage [V]
PM = TO-220ACFP (2)

Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Code Key
Standard	DPG 10 I 400 PM	DPG10I400PM	Tube	50	503778

Similar Part	Package	Voltage Class
DPG10I400PA	TO-220AC (2)	400

Outlines TO-220FP





SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.177	.193	4.50	4.90
A1	.092	.108	2.34	2.74
A2	.101	.117	2.56	2.96
b	.028	.035	0.70	0.90
b1	.050	.058	1.27	1.47
c	.018	.024	0.45	0.60
D	.617	.633	15.67	16.07
d1	0	.043	0	1.10
E	.392	.408	9.96	10.36
e	.100 BSC		2.54 BSC	
H	.255	.271	6.48	6.88
L	.499	.523	12.68	13.28
L1	.119	.135	3.03	3.43
ØP	.121	.129	3.08	3.28
Q	.126	.134	3.20	3.40

NOTE:

1. All metal surface are matte pure tin plated except trimmed area.

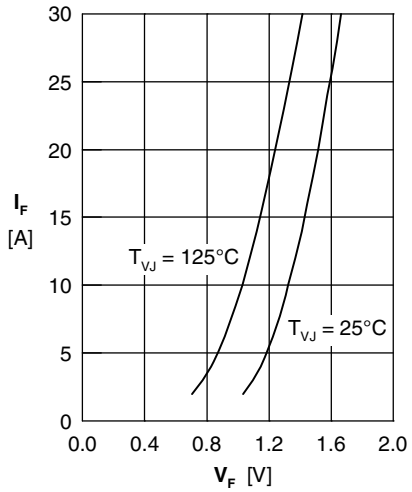


Fig. 1 Forward current I_F versus forward voltage drop V_F

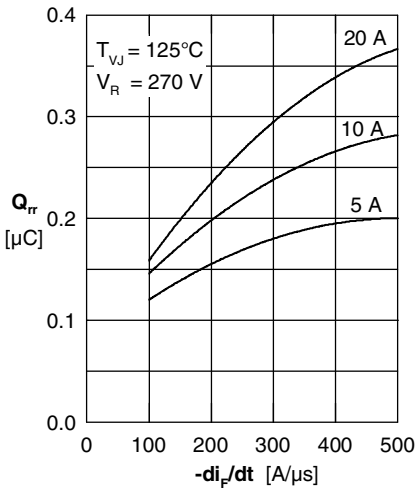


Fig. 2 Typ. reverse recovery charge Q_{rr} versus $-di_F/dt$

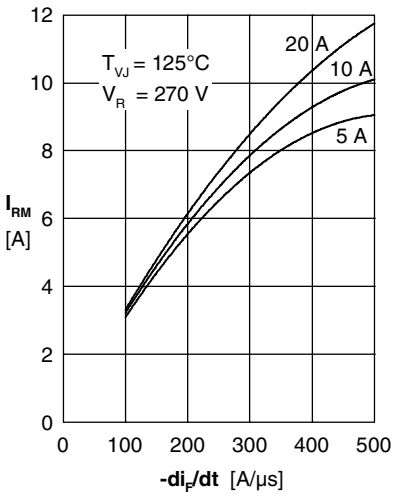


Fig. 3 Typ. reverse recovery current I_{RM} versus $-di_F/dt$

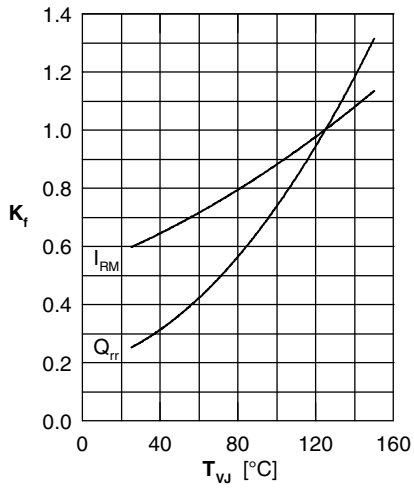


Fig. 4 Dynamic parameters Q_{rr}, I_{RM} versus T_{VJ}

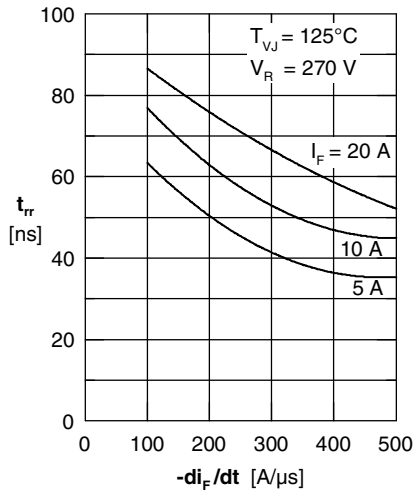


Fig. 5 Typ. reverse recovery time t_{rr} versus $-di_F/dt$

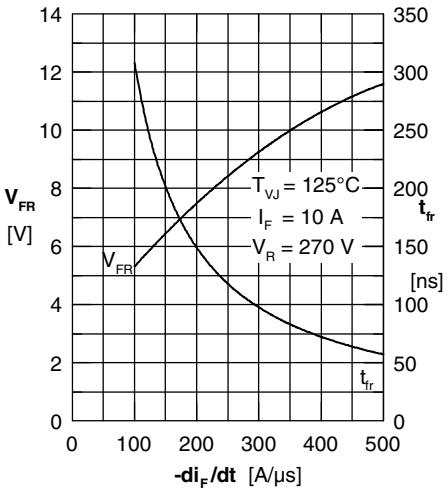


Fig. 6 Typ. forward recovery voltage V_{FR} and t_{fr} versus di_F/dt

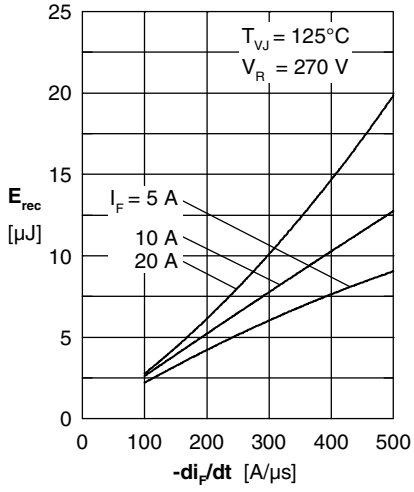


Fig. 7 Typ. recovery energy E_{rec} versus $-di_F/dt$

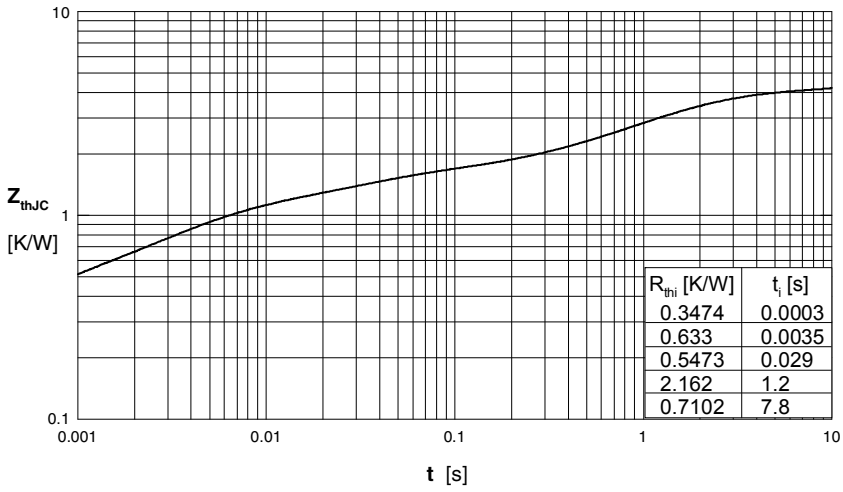


Fig. 8 Transient thermal resistance junction to case